

Aloha

2021 Update

Fuel Tank Advisory Committee (FTAC)

May 20, 2021





Review of Sites

Permanently out of use:

- Hickam POL Annex (Kipapa)
- Hickam POL Annex (Waikakalaua)

Temporarily out of use (pending decommissioning):

- Kuahua Peninsula (a.k.a. Diesel Purification Plant)

Currently in use:

- Pacific Missile Range Facility Fuel Farm
 - Red Hill Bulk Fuel Storage Facility
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Hickam Fuel Annexes



Kipapa:

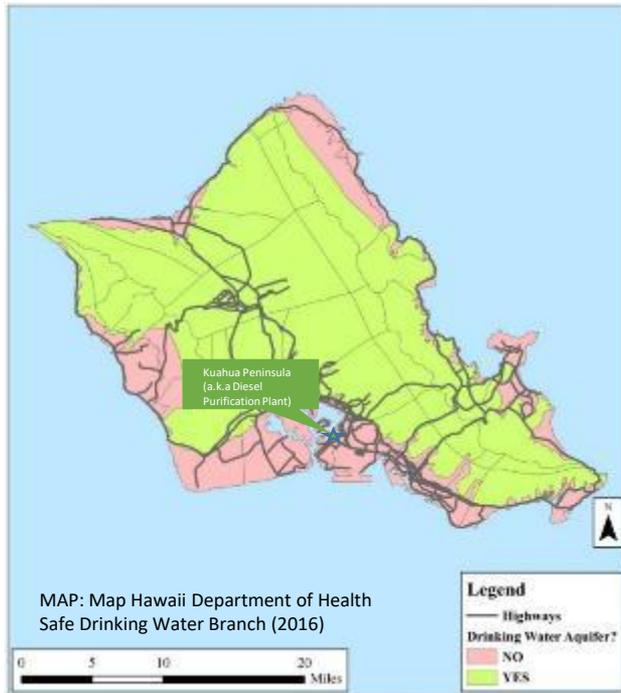
- Monitored natural attenuation enhanced with bioventing (currently shutdown)
- Annual groundwater monitoring annually

Waikakalaua:

- A Record of Decision approved and signed by DOH on 19 Oct 2009 with a no further action decision



Kuahua Peninsula (a.k.a Diesel Purification Plant)



Kuahua:

- Contract in progress to empty, clean, cap, and secure eight USTs and associated piping
- Area development plan includes removing the USTs and tank system, no timeline yet for the demolition



Pacific Missile Range Facility



PMRF:

- Five tanks at PMRF currently in use continue to successfully pass monthly release detection evaluation
- Four tanks removed from service due to reduced requirement for operational storage at this time





Red Hill Bulk Fuel Storage Facility

Navy Update on the Administrative Order on Consent (AOC)

- Completed items since the last FTAC
- On-going Actions
- Targeted items for completion before the next FTAC



Red Hill Bulk Fuel Storage Facility Update on AOC Actions

Actions completed since last meeting:

- Submitted Metal Fatigue Practices Execution Plan (November 2020)
- Submitted RVA Phase 2 Statement of Work (December 2020)
- Installation of three additional Red Hill Monitoring Wells
- Submitted Continuous Soil Vapor Monitoring Pilot Plan (March 2021)
- The eleventh Technical Working Groups (w/ AOC Parties)



Monitoring well installation activities.
U.S. Navy photo by Denise Emsley, Public Affairs.



Red Hill Bulk Fuel Storage Facility Update on AOC Actions

Ongoing work:

- Semi-annual Tank Tightness Testing in progress
- Purchase of Tank Tightness Testing Equipment
- Real Time Soil Vapor Monitoring Pilot Project
- Installation of Red Hill Monitoring Well No. 12A
- Planning Groundwater Flow and Velocity Project
- TUA/RD Supplemental Development
- Feasibility study for secondary containment at Red Hill
- Partnership with the University of Hawaii
- Quarterly Groundwater Monitoring
- Monthly Soil Vapor Monitoring
- Monthly Water Interface Measurements
- Annual Water Quality Reporting in June





Drinking Water Remains Safe & Clean - Year after Year

"[W]e conducted tests for over 70 contaminants that have potential for being found in your drinking water.....In all cases, the levels measured met both EPA and State Requirements for **safe drinking water.**"
 -Joint Base Pearl Harbor-Hickam Water June 2020 Water Quality Report

2020 Annual Water Quality Report
 Joint Base Pearl Harbor-Hickam Water System
 (Waiawa, Halawa & Red Hill Sources)

This report meets federal and state requirements for Consumer Confidence Reports. This report is updated annually and reflects monitoring data collected up to Dec. 31, 2019.

The Navy is pleased to provide you with this year's annual Water Quality Report for the Joint Base Pearl Harbor-Hickam Water System.

This pamphlet provides information about the water that has been delivered to you over the past year, it describes where your water comes from, what it contains, and how it compares to standards for safe drinking water.

Our goal is, and always has been, to provide you safe and dependable drinking water.

Water Provider
 The Naval Facilities Engineering Command (NAVFAC) Hawaii operates the water system serving your area as the only water provider in the area. We primarily supply water to military installations and housing.

Drinking Water Standards
 The Environmental Protection Agency (EPA) and state of Hawaii regulations require us to test your water for contaminants on a regular basis, making sure it is safe to drink, and to report our results accordingly.

To ensure that tap water is safe to drink, EPA provides regulations which limit the amount of certain contaminants in water supplied by public water systems. The Food and Drug Administration does the same for bottled water.

In the last comprehensive monitoring period, we conducted tests for over 70 contaminants that have potential for being found in your drinking water. 7000+ in total. We tested for 70+ and 100+ above the levels of concentrations of regulated contaminants found in your water. In all cases, the levels measured met both EPA and state requirements for safe drinking water.

We are routinely working to protect your drinking water from contaminants. The State of Hawaii's Department of Health completed the Ground Water Assessment in 2004. This document identifies the responsibility of your water supply to meet standards. The source water assessment is available for review by contacting NAVFAC Naval Public Affairs at 808-491-0100.

Source of Water
 Your drinking water comes from three ground water sources: Waiawa, Halawa, and Red Hill. Ground water is naturally filtered as it travels from the surface by the aquifer below ground. The water is pumped up from the aquifer, distributed, filtered, and piped into the distribution system.

Possible source of contaminants
 The sources of drinking water (both tap water and bottled water) include rivers, lakes, streams, ponds, reservoirs, springs and wells. As water travels over the surface of the land or through the ground, it dissolves naturally occurring minerals, and can also pick up other substances resulting from the presence of animals or human activity. Drinking water, including bottled water, may reasonably be expected to contain at least small amounts of some contaminants. The presence of contaminants does not necessarily indicate that the water poses a health risk.

More information about contaminants and potential health effects can be obtained by calling the EPA's safe Drinking Water Hotline at 1-800-426-8020.

Potential Contaminants
 Contaminants that may be present in your source water include:

- Microbial contaminants** - such as viruses and bacteria, which can cause liver, kidney and other diseases, gastrointestinal upset, and diarrhea.
- Inorganic contaminants** - such as salts and metals, which can be naturally occurring or result from urban storm water runoff, industrial or domestic wastewater discharges, oil and gas production, mining, or farming.
- Pesticides and herbicides** - which may come from a variety of sources such as agriculture, urban areas, lawn care, and residential use.
- Organic chemical contaminants** - including synthetic and volatile organic chemicals, which are by-products of industrial processes and petroleum production, and can also come from gas stations, urban areas, water runoff, and septic systems.
- Nitrate/nitrite contaminants** - which can be naturally occurring or be the result of oil and gas production and mining activities.
- Radon** - If present, radon levels at local water sources, wells, and ponds, especially for pregnant women and young children, can

2020 ANNUAL WATER QUALITY REPORT

The water quality monitoring program at Joint Base Pearl Harbor-Hickam is a comprehensive program that monitors drinking water for 70+ different types of contaminants. Below is a complete list of regulated and unregulated contaminants.

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Regulated Primary Contaminants

Asbestos	Chloride	Fluoride	Sulfate
Barium	Copper	Lead	Synthetic organic chemicals
Bromide	Dissolved Solids	Nitrate	Synthetic organic chemicals (VOC)
Cadmium	Iron	Nitrite	Turbidity
Calcium	Manganese	Radon	Total Coliform
Chlorine	Mercury	Total Dissolved Solids (TDS)	Total Coliform Bacteria (TCB)
Chromium	Nickel	Total Hardness	Total Coliform Bacteria (TCB)
Cyanide	Phosphate	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Dissolved Solids	Radon	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Fluoride	Secchi Disk	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Iron	Total Hardness	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Lead	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Manganese	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Mercury	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Nickel	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Nitrate	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
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Radon	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Sulfate	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Synthetic organic chemicals	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Synthetic organic chemicals (VOC)	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Turbidity	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
Total Coliform	Total Suspended Solids (TSS)	Total Suspended Solids (TSS)	Total Dissolved Solids (TDS)
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Unregulated Contaminants

Asbestos	Chloride	Fluoride	Sulfate
Barium	Copper	Lead	Synthetic organic chemicals
Bromide	Dissolved Solids	Nitrate	Synthetic organic chemicals (VOC)
Cadmium	Iron	Nitrite	Turbidity
Calcium	Manganese	Radon	Total Coliform
Chlorine	Mercury	Total Dissolved Solids (TDS)	Total Coliform Bacteria (TCB)
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Measurements - In this water, we pay attention to 70+ different types of contaminants. Below is a complete list of regulated and unregulated contaminants.

"The water serving Halawa Shaft and Moanalua Wells has been tested and meets all Federal and State standards."
 * Board of Water Supply 2020 Water Quality Report



Red Hill Bulk Fuel Storage Facility Update on AOC Actions

Actions scheduled for completion prior to next meeting:

- Continue installation of additional Red Hill Monitoring Wells
- Continue to conduct semi-annual Tank Tightness Testing
- Continue to execute Long-term Quarterly Groundwater Monitoring and Monthly Soil Vapor Monitoring
- Receive, review and reply to EPA/DOH on:
 - RVA Phase 2 Statement of Work
 - Groundwater Flow Modeling Report
 - Investigation and Remediation of Releases Report
 - Modified Corrosion and Metal Fatigue Practices Execution Plan
- Submit and obtain approval from EPA/DOH of:
 - Tank Upgrade Alternative & Release Detection Supplemental
- Pursue permanent Tank Tightness Testing and Continuous Soil Vapor Monitoring





Layers of Protection

PREVENTION

1. Improving Tank Inspection, Repair and Maintenance Program continuously
2. Recoating tank interior steel liners to prevent corrosion as specified by coating specialist
3. Decommissioning nozzles (piping at bottom of tank) to reduce risk
4. Enhanced contractor qualification process to improve tank inspection and repairs
5. Updated processes and procedures for inspection, testing, quality control, quality assurance
6. Upgraded procedures for returning tanks to service
7. Revised and standardized operator training
8. Commitment to secondary containment

DETECTION

1. Conducting continuous (versus monthly) soil vapor monitoring
2. Conducting daily visual inspection of pipeline
3. Conducting manual fuel inventory trend analysis
4. Installing permanent enhanced release detection system in each tank
5. Increased tank tightness testing from annual to semi-annual, twice the state requirement
6. Improved fuel inventory monitoring using automated fuel handling equipment
7. Increased groundwater monitoring wells from 7 to 19 since 2015; add 11 more by 2023 totaling 30 monitoring wells
8. Quarterly groundwater monitoring

MITIGATION

1. Use of Red Hill Shaft as capture zone (groundwater modeling)
2. Natural breakdown of fuel constituents in the environment
3. Improving release response procedures continuously
4. Development of reserve capacity storage plan prior to filling tanks

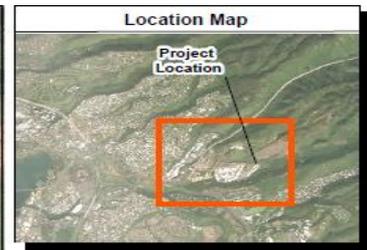
System of Systems



Extensive Groundwater Monitoring Network

RED HILL GROUNDWATER MONITORING NETWORK:

- The Navy continues to install new monitoring wells to expand its Red Hill groundwater monitoring network.
- The network currently consists of Red Hill Shaft and 19 monitoring wells throughout Red Hill and in South Hālawā Valley.
- The Navy regularly tests groundwater in all network monitoring wells and in Red Hill Shaft.
- Drinking water at Red Hill Shaft has always tested safe for drinking.



Legend

- Proposed Monitoring Well Location
- Existing Conventional Monitoring Well Location
- Existing Multilevel Monitoring Well Location
- Existing Test Boring
- Supply Well
- Existing Monitoring Well and Existing Adjacent Location
- Proposed Monitoring Well and Proposed Adjacent Location
- In-Progress Monitoring Well and Existing Adjacent Location
- Red Hill Fuel Storage Tank
- Stream
- ▭ Red Hill Installation Boundary

Notes

1. Map projection: NAD 1983 Hawaii State Plane Z3 ft
2. Base Map: Google Earth 2019
3. Coordinates: NAD 1983 Hawaii State Plane Z3 ft
4. Some locations are subject to field verification.
5. Revised November 2020.

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1,000 500 0 500 1,000 Feet

Proposed and Existing Monitoring Well Locations
Red Hill Bulk Fuel Storage Facility
JBPBH, O'ahu, Hawai'i

KEY TO BOTH DETECTION AND MITIGATION



Current Clean, Inspect and Repair Program



The Regulatory Agencies approved the Clean, Inspect and Repair (CIR) Process for Red Hill

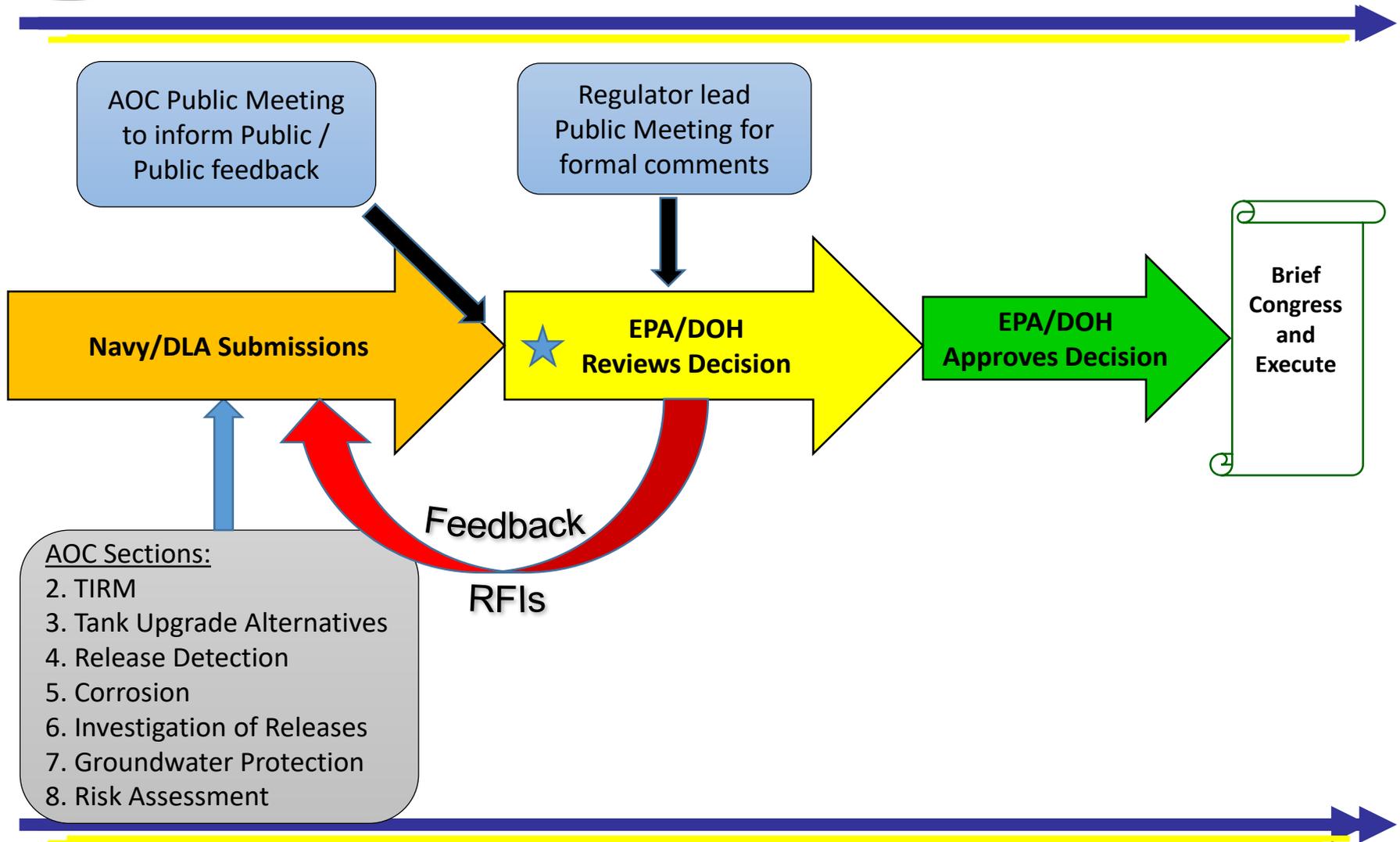
- Detailed marking of a tank allows for a more precise/thorough inspection. This results in higher quality control and quality assurance.
- This state-of-the-art technology identifies the difference between:
 - Aesthetics – dents, etc. (non-actionable)
 - Defects – welds, pits, etc. (actionable)
 - Corrosion – plate thickness (actionable)
- Redundancy – redundant measures in place
- The filling sequence has been refined to better detect problems (i.e. 4 tank tightness tests rather than just one at the end)

TODAY'S CORNERSTONE OF PREVENTION



AOC Decision Process

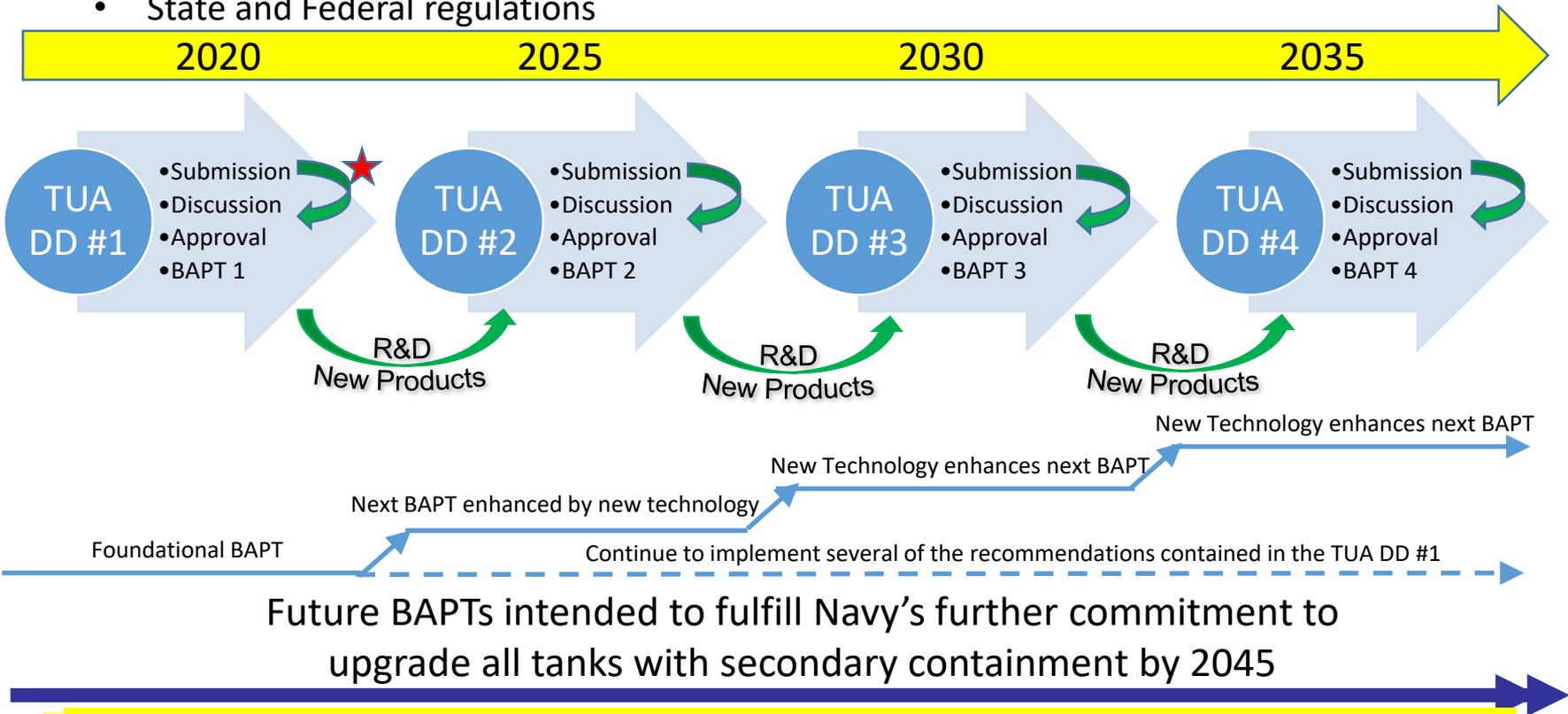
**Repeat Process At least Every Five (5) Years*





AOC TUA DD Timeline

- TUA Decision Document has a 5-year term
- TUA Decision Document recommends the Best Available Practicable Technology (today)
 - Future products will be included in the next TUA Decision Document
- State still has regulatory oversight of Red Hill after the AOC is satisfied
 - State and Federal regulations





FY21 UH-USN Partnership



Five additional corrosion studies for College of Engineering funded by grant from ONR for \$4M:

1. Corrosion Inspect and Repair Protocols Project for Red Hill UST
2. Advanced Electron Microscopy for Red Hill UST Corrosion Products and Assessment of Remediation Approaches
3. Concrete Tank Degradation Inspection and Retrofit for Red Hill UST
4. Hybrid Multifunctional Smart and Adaptive Nanocoating for Red Hill
5. Friction Surfacing Coating and Crack Fill Project for Red Hill UST



FY22 UH-USN Partnership



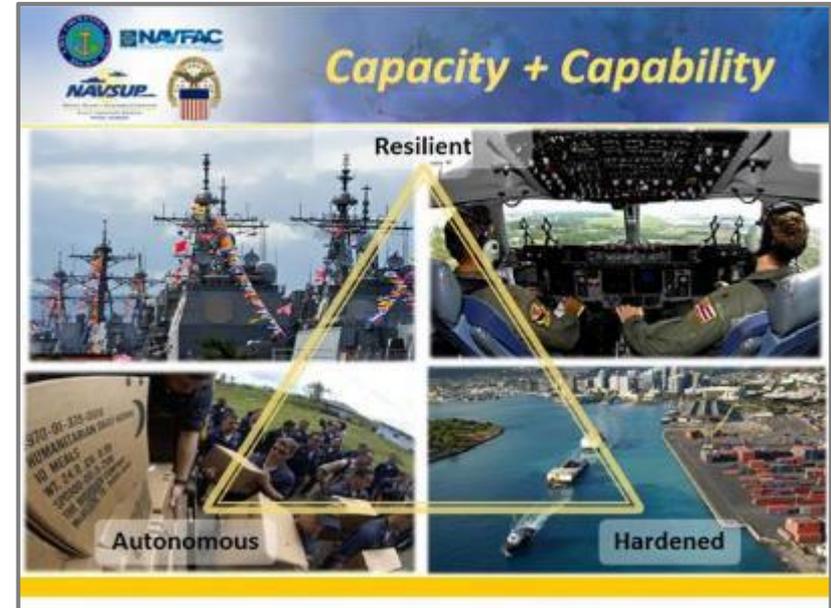
Six additional studies for College of Engineering and Applied Research Laboratory once grant is received from ONR.

1. Autonomous submersible system to collect and remove sludge and water from an in-service Red Hill storage tank without damage to coating.
2. Robust optical core communications network architecture between tank gallery and control room for current and future data needs.
3. Root cause analysis for corrosion on stainless steel piping.
4. Concept to distribute additional electrical power at various voltages and with adequate current in upper and lower access tunnels at Red Hill
5. Integrate future streaming data sources (inventory, tightness test, monitors) into an operator dashboard at the Red Hill control room. Securely integrate sensor and data links into a visualization tool suitable for use within the existing control architecture.
6. Test and report effects of ferrous contamination on stainless steel immersed in jet fuel. Produce test data and develop probabilistic model for initiation of corrosion as function of size, concentration, and electrolyte chemistry.



Summary

- Investments to protect drinking water
 - \$219M since AOC was signed
 - \$470M through FY25
- Navy moving forward with Secondary Containment
- Navy's partnership with University of Hawaii
- Water continues to be safe to drink
 - Routine water sampling/testing
- Tanks continue to pass semi-annual tank tightness tests
- AOC is working
 - Navy/DLA meeting all AOC deadlines
 - Navy/DLA is accountable to EPA and the State of Hawaii
- TUA and Release Detection Supplemental will be released late Spring / early Summer
- Red Hill fuel is critical to National Security and the people of Hawaii



Protecting our nation's security, our environment, and human health

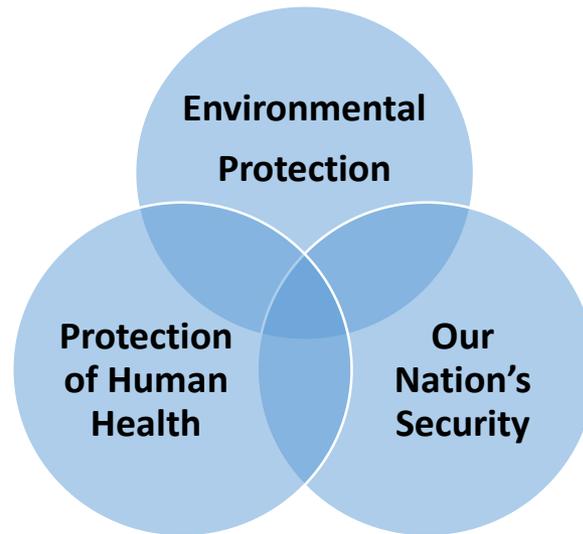


Fuel Source During Blackout





And Finally.....



The Navy is taking significant actions to protect our environment, our nation's security, and human health

The final Tank Upgrade Alternative Decision accomplishes all three of these important goals



Mahalo

Questions?

